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# *City of El Centro Water and Wastewater Service Area Plan*

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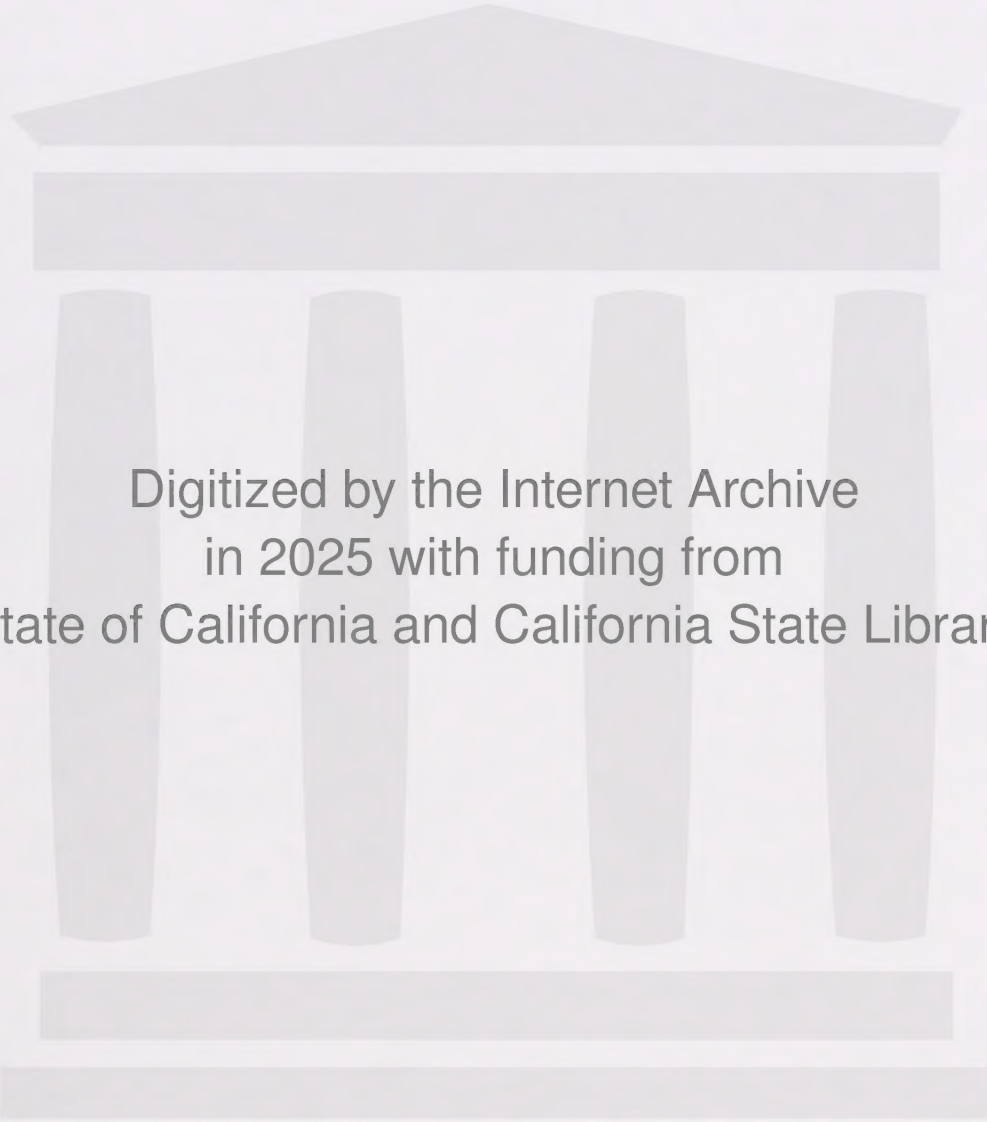
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**CITY OF EL CENTRO**  
**WATER AND WASTEWATER SERVICE AREA PLAN**  
*for*  
**PROPOSED SPHERE OF INFLUENCE EXPANSION**

**LOCAL AGENCY FORMATION COMMISSION**  
**IMPERIAL COUNTY, CALIFORNIA**

*prepared for the*

**CITY OF EL CENTRO**

**March 1995**

*prepared by*

**PARSONS ENGINEERING SCIENCE, INC.**  
9404 Genesee Avenue, Suite 140  
San Diego, California 92037

THE UNIVERSITY OF CHICAGO  
DIVISION OF THE PHYSICAL SCIENCES  
DEPARTMENT OF CHEMISTRY

RESEARCH REPORT  
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## **EXECUTIVE SUMMARY**





## **EXECUTIVE SUMMARY**

This Service Area Plan for Water and Wastewater Services has been prepared in accordance with the requirements of Imperial County Local Agency Formation Commission in support of a request by the city of El Centro to expand its Sphere of Influence. The Service Area Plan addresses provision of water and wastewater services to future development within the City's proposed expanded Sphere of Influence.

### **BACKGROUND**

The city of El Centro (City) is located in the Imperial Valley of Imperial County, California. The incorporated area of the City presently covers approximately 5,900 acres. The City recently completed annexation of five areas totaling approximately 1,900 acres. The present population of the City is estimated to be 36,450 (Reference 1). The City provides water treatment and distribution service and wastewater collection, treatment, and disposal service within the City limits and to County facilities south of the City. The City will provide water and wastewater services to development within future annexations to the City.

The Imperial County Local Agency Formation Commission (LAFCO) is responsible for establishing service area boundaries for public agencies in Imperial County. The potential ultimate service area boundary for an agency is referred to as its sphere of influence. The City's Sphere of Influence, established by LAFCO in 1977, covers a total area of approximately 11,600 acres including the incorporated area of the City and adjacent unincorporated land (approximately 5,700 acres).

### **LAND USE PLANNING**

The City's 1990 General Plan covered areas to the south beyond the present Sphere of Influence to McCabe Road. The City is proposing an expansion of its Sphere of Influence. On the south, the revised Sphere would extend to McCabe Road consistent with the General Plan planning area. On the east, the expanded Sphere would extend to the quarter section line east of Highway 111. The proposed expanded Sphere of Influence covers an area of approximately 17,500 acres.

The General Plan is based on a two phase growth program which provides for development of Phase I areas prior to development of areas within Phase II. The Phase I and Phase II development areas do not cover the entire General Plan planning area. Area outside of the Phase I and Phase II areas but within the planning area are proposed in the General Plan to remain in very low density uses. The City is presently considering a revised phased growth program which allows development to proceed on a tiered priority basis. The overall tiered future development area generally corresponds to the Phase I and Phase II development area.

The 1994 annexation areas included areas generally within Phase I, but also included areas within Phase II and outside of both Phase I and Phase II.



## **PURPOSE OF SERVICE AREA PLAN**

This Service Area Plan has been prepared in accordance the requirements of Imperial LAFCO to be submitted with the City's Sphere of Influence Plan for the expanded Sphere of Influence. As required by Imperial LAFCO, the Service Area Plan addresses the following specific issues associated with the ability of the City to provide water and wastewater service in the expanded Sphere of Influence:

- a. A projection of the geographic extent of service capabilities during the next 20 years delineated in 5 year increments.
- b. Projected level of service capabilities in the same time frames and geographic areas.
- c. Actual and projected costs of services to consumers, including a statement of actual and projected allocation of the cost of services between existing and new residents.
- d. Sufficient information concerning current and projected capital programs, revenues, costs, rate structures and financing, and other information necessary to support the projected service capabilities and areas set forth in the Service Area Plan.

This document is an attachment to the application for expansion of Sphere of Influence being submitted by the City to Imperial LAFCO for the area described above and shown on Figure ES-1.

## **WATER AND SEWER SYSTEM MASTER PLANNING**

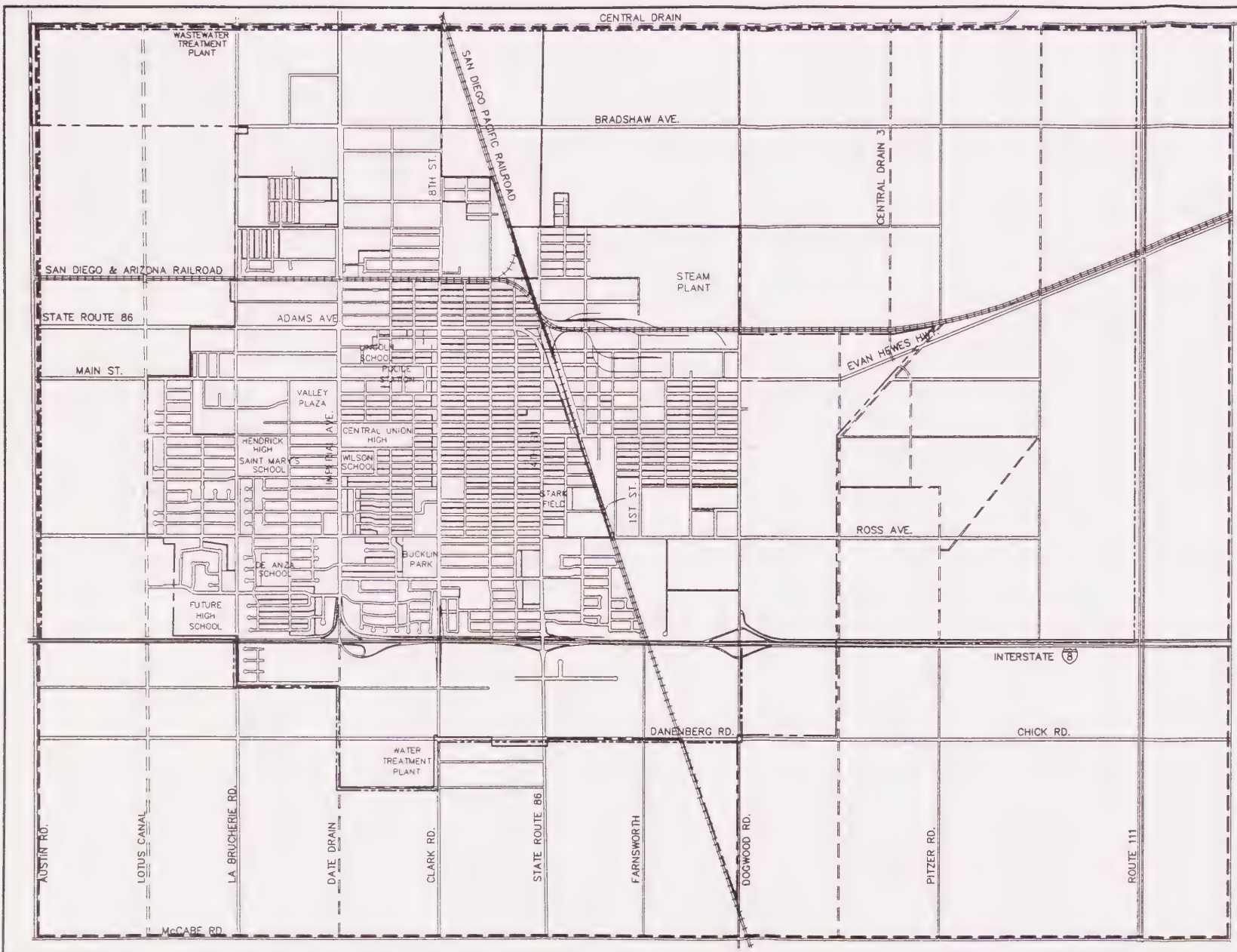
Master planning for the City's water and sewer facilities was updated in 1994. The planning defined facilities required to serve ultimate future development in accordance with the City's current General Plan. For the water and sewer master planning, the ultimate future service area for the water and sewer systems was established as the General Plan Phase I and Phase II development areas and the 1994 annexation areas not included in Phase I or Phase II. This Service Area Plan is based on the recommended facilities and cost estimates from the updated water master plan and sewer master plan.

## **STUDY AREA**

For the purposes of this Service Area Plan, the Study Area is established as the proposed expanded Sphere of Influence excluding the incorporated area of the City prior to the recent annexations. The recently annexed 1,900 acres is included in the Study Area because, in general, it is presently not provided with City water and sewer service (Reference 5). Figure 1 shows the present city limits, present Sphere of Influence, and the proposed expanded Sphere of Influence.







# LEGEND

- STUDY AREA ————
- SPHERE OF INFLUENCE ————
- CITY LIMITS ————



FIGURE ES-1

STUDY AREA



## **SERVICE AREA PLAN FOR WATER SERVICE**

### **Level of Service Capabilities**

The City provides water treatment and distribution service within the city limits and to County facilities south of McCabe Road. The City owns and operates a water treatment plant which provides clarification, filtration, and disinfection of Colorado River water. Raw water is delivered to the plant through the Imperial Irrigation District (IID) All American Canal and Date Canal. Treated water is pumped from storage tanks to users through a grid of distribution pipelines and water mains.

### **Capacity of Existing Facilities for Present Service Area**

The City recently completed a water system capital improvement project which increased treated water storage capacity and distribution pumping capacity. The project also increased the water pressure in the system which has improved capacity of the water distribution system.

The Water Master Plan Update identified additional improvements to the existing water facilities to increase the reliability of the filtration and distribution pumping systems and to replace a few existing water mains with larger pipelines to improve distribution. Based on the results of the Water Master Plan Update, the existing raw water storage and treatment facilities have adequate capacity to meet the demands of the existing service area and several years of future development. Existing treated water storage is adequate for eight years of projected growth and present distribution pumping capacity is adequate for four years of projected growth.

### **Existing Service Capabilities Within Study Area**

The Imperial Water District supplies Colorado River water to Imperial County through an extensive canal system. Water supplied by IID is primarily for agricultural uses. IID also supplies raw water to cities and water districts which treat and distribute the water for potable uses within their service areas. IID currently provides limited water service directly to unincorporated properties within the City's Sphere of Influence. Water supplied directly by IID to County properties is not treated and is for nonpotable uses.

Properties outside the City limits have the option to tie into the City's existing water distribution system for either potable water service or for fire prevention. Connection of County properties to the City water system is only practical where water mains are located in the vicinity of the property. Water rates for properties outside the City are higher than for properties located within the City jurisdiction.

It has been determined that there is a need to provide potable water service within the unincorporated areas of Imperial County. IID is conducting discussions with various agencies within the County to determine the best approach to providing potable water service to unincorporated areas of the County, including the presently unincorporated portions of the Study Area.





## **Projected Service Capabilities Within Study Area**

The Water Master Plan Update is based on ultimately providing potable water service for all areas within the Phase I and Phase II planning areas (generally Tiers I through III) and the 1994 annexation areas not within Phase I or Phase II. Water service for very low density residential development outside of the Phase I and Phase II service areas but within the Study Area will be through the use of individual on-site treatment systems or as otherwise determined for serving rural development in Imperial County.

## **Cost of Water Services**

### **Capital Costs**

The 1994 Water Master Plan Update identified required capital improvements to the water treatment and distribution facilities to maintain service levels to the existing service area and to provide service to future development areas. In general, the improvements identified in the Water Master Plan Update are required to provide capacity for future development.

The required capacity improvements can be grouped into two categories:

1. Raw water storage, treatment facilities, treated water storage, and water distribution pumping.
2. Distribution pipelines.

The costs for treatment, storage, and pumping capacity are independent of the location of the development requiring water service. Due to the nature of the City's water distribution system (single pressure zone and off-line storage), the requirements for distribution pumping and storage are the same throughout the existing service area and the proposed future service area. Costs for water treatment, storage, and pumping capacity were projected in proportion to projected population growth. Costs for pipelines were projected based on development in accordance with the proposed tiered growth program. Capital costs for water facilities to serve future growth over the 20 year planning period are presented in five year increments in Table ES.1. Table ES.1 includes an approximation of the capital cost per dwelling unit for water service for each of the five year increments over the 20 year planning period.

The total cost for the period ending in the year 2000 is higher than the total for the other periods because of raw water storage and treatment capacity costs projected to be incurred that period. The cost of these capacity additions will actually be repaid by development in later periods. The overall cost per dwelling unit is approximately \$2,360; which is the \$21.6 million estimated cost through 2015 divided among a projected additional 9,180 dwelling units by 2015. These costs do not include financing costs.

The unit costs discussed above and presented in Table ES.1 are intended to provide a general estimate of the capital cost per dwelling unit for water facilities to serve future development. These unit costs consider only residential development. Additional revenue will be realized from future commercial and industrial users. Presently,





**Table ES.1**

**Estimated Cost of Water Service  
for Future Development  
(\$1,000<sup>a</sup>)**

Year	2000	2005	2010	2015	Total
Raw Water Storage	\$2,100	\$0	\$2,100	\$0	\$4,200
Treatment Facilities	\$3,200	\$0	\$1,600	\$0	\$4,800
Treated Water Storage	\$0	\$1,000	\$0	\$1,500	\$2,500
Distribution Pumping	\$350	\$250	\$0	\$700	\$1,300
Distribution Pipelines	<u>\$1,610</u>	<u>\$1,740</u>	<u>\$2,670</u>	<u>\$2,800</u>	<u>\$8,820</u>
Total	\$7,260	\$2,990	\$6,370	\$5,000	\$21,620
Unit Costs					
No. of Dwelling Units	1,800	2,080	2,430	2,870	9,180
Cost per Dwelling Unit <sup>b</sup>	\$4,030	\$1,440	\$2,620	\$1,740	\$2,360

<sup>a</sup> Costs are in present dollars.

<sup>b</sup> Actual cost will be less with contribution from commercial/industrial development.

commercial and industrial water use is approximately 30 percent of the total water demand in the City. If the future service area develops with similar commercial/industrial demands, the overall capital cost per dwelling unit would be approximately \$1,700.

**Operation and Maintenance Costs**

The City's 1995 budget for operation and maintenance of the water treatment and distribution system is approximately \$3.0 million. This operation and maintenance budget is the total water utility budget less repayment of debt. Not considering contributions from commercial and industrial users, this annual operation and maintenance cost represents an average annual cost of approximately \$280 per single family residential dwelling unit. It is projected that operation and maintenance costs for the water system will increase in proportion to water demand which will increase in direct proportion to population growth. In that case, the projected cost per user for operation and maintenance costs over the 20 year planning period would remain the same as above in terms of present dollars.



provide adequate financing for water service to some of the Tier I areas, but in general will not meet the capital requirements for providing water service to future development areas.

### **Capital Improvements**

Costs for major water system capital improvements for service to the existing service area have historically been financed by long term debt which is repaid from water sales and connection fee revenue.

The method of financing capital costs of facilities to provide water service to areas presently not within the existing service area will either be through formation of an assessment district, funding by a developer, or other method.

Operation and maintenance costs are financed by revenue from water usage charges and meter charges.

## **SERVICE AREA PLAN FOR WASTEWATER SERVICE**

### **Level of Service Capabilities**

#### **Existing Service Capabilities**

The City provides wastewater collection, treatment, and disposal service within the city limits and to County facilities south of McCabe Road. The City owns and operates a wastewater treatment plant which provides secondary level treatment of wastewater from the service area and discharges treated wastewater to the Alamo River. The City owns and operates a wastewater collection and transmission system which is comprised of collector sewers, trunk sewers, lift stations, and force mains.

#### **Capacity of Existing Facilities for Present Service Area**

The Sewer Master Plan Update found that the existing trunk sewer system is adequate for the existing area. The La Brucherie trunk sewer has capacity to serve future development on the east and southeast of the Study Area, including future expansion of the County facilities south of the Study Area. However, the other trunk sewers generally do not have available capacity to serve future development outside of the present service area. The Sewer Master Plan Update recommended replacement of the Eastside Lift Station due to age and upgrading of Lift Station No. 3 to match the capacity of the La Brucherie trunk sewer.

#### **Existing Service Capabilities Within Study Area**

Wastewater from existing development within the Study Area is disposed of through on-site individual or community septic tank and leach field systems in accordance with the requirements of the Imperial County Health Department.

#### **Projected Service Capabilities Within Study Area**

The Sewer Master Plan Update is based on ultimately providing wastewater collection and treatment at the City treatment facilities for all areas within the Phase I and Phase II planning areas (generally Tiers I through III) and the 1994 annexation areas not within





Phase I or Phase II. Wastewater disposal for very low density residential development outside of the Phase I and Phase II service areas but within the Study Area will be through the use of on-site septic tank and leach field systems.

## **Cost of Wastewater Service**

### **Capital Costs**

The 1994 Sewer Master Plan Update identified required capital improvements to the wastewater collection and transmission facilities to maintain service levels to the existing service area and to provide service to future development areas. In general, the improvements identified in the Sewer Master Plan Update are required to provide capacity for future development.

The required capacity improvements can be grouped into three categories:

1. Treatment and disposal facilities.
2. Trunk sewer pipelines.
3. Lift stations and force main pipelines.

The costs for treatment and disposal capacity are independent of the location of the development requiring the service. The costs for trunk sewer pipelines depend on the location of the development relative to treatment facilities. Costs for lift stations and force mains are a function of the location of the drainage basin relative to the treatment facilities.

Capital costs for wastewater facilities to serve future growth over the 20 year planning period are presented in five year increments in Table ES.2. Table ES.2 includes an approximation of the capital cost per dwelling unit for wastewater service for each of the five year increments over the 20 year planning period.

The costs for the period ending in the year 2005 are higher than the other periods because of the treatment capacity cost projected to be incurred that period for the first phase of the proposed second treatment plant. The cost of this capacity addition will actually be repaid by development in subsequent periods. The overall cost per dwelling unit is approximately \$2,070; which is the total estimated cost of \$19.0 million through 2015 divided among a projected additional 9,180 dwelling units by 2015. These costs do not include financing costs.

The unit costs discussed above are intended to provide a general estimate of the capital cost per dwelling unit for wastewater facilities to serve future development. These unit costs consider only residential development. Additional revenue will be realized from future commercial and industrial users. Presently, commercial and industrial wastewater flows are approximately 40 percent of the total flow in the City. If the future service area develops with similar commercial/industrial flows, the overall capital cost per dwelling unit will be approximately \$1,300.



**Table ES.2**

**Estimated Cost of Wastewater Service  
for Future Development  
(\$1,000<sup>a</sup>)**

Year	2000	2005	2010	2015	Total
Treatment Facilities	\$0	\$8,000	\$0	\$0	\$8,000
Collection/Conveyance Facilities	<u>\$2,100</u>	<u>\$2,210</u>	<u>\$3,310</u>	<u>\$3,420</u>	<u>\$11,040</u>
Total	\$2,100	\$10,210	\$3,310	\$3,420	\$19,040
Unit Costs					
No. of Dwelling Units	1,800	2,080	2,430	2,870	9,180
Cost per Dwelling Unit <sup>b</sup>	\$1,170	\$4,910	\$1,360	\$1,190	\$2,070

<sup>a</sup> Costs are in present dollars.

<sup>b</sup> Actual cost will be less with contribution from commercial/industrial development.

### **Operation and Maintenance Costs**

The City's 1995 budget for operation and maintenance of the wastewater collection and treatment facilities, excluding profession services and capital expenditures associated with the existing plant expansion and planning for the second plant, is approximately \$2.5 million. Excluding contributions from commercial and industrial users, this annual operation and maintenance cost represents an average annual cost of approximately \$230 per dwelling unit excluding commercial and industrial contributions. It is projected that wastewater operation and maintenance costs will increase in proportion to wastewater volumes which will increase in proportion to population growth. In that case, the projected operation and maintenance cost per user would remain the same as above over the 20 year planning period.

### **Debt Repayment**

The City incurred long term debt of \$4,460,000 in 1994 to finance construction of the wastewater treatment plant expansion. The City is also repaying other long term debt associated with the wastewater system. As described below, long term debt for capital improvement projects is repaid from wastewater connection fee and service fee revenue. Present annual debt repayment costs are \$541,492, or \$50 per single family dwelling unit excluding commercial and industrial contributions.



## **Projected Allocation of Cost of Wastewater Service**

Allocation of costs for wastewater collection, transmission, treatment, and disposal service between existing and new residents will be in accordance with the following:

- yCosts for additional capacity for wastewater treatment required to provide service to new development will be paid by the new development through connection fees and wastewater service charges.
- Costs for collection sewers to serve new development will be paid by new development through assessment district financing or developer financing.
- Costs for trunk sewers to serve future development areas will be shared among developments contributing flow to the trunk sewer.
- Costs for lift stations and force mains to serve future development areas will be shared among the developments contributing flow to the lift station.
- Costs for capital improvements to maintain service to existing service area will be paid by existing users through wastewater service charges.
- Costs for capital improvements to upgrade facilities to meet new regulatory requirements will be paid by all users through wastewater service charges.
- Operation and maintenance costs will be paid by all user through monthly wastewater service charges.

## **Financing of Wastewater Service**

### **Present Wastewater Service Charges**

Nearly all of the annual wastewater utility revenue is from wastewater service charges. Single family and duplex users are charged a fixed monthly rate for wastewater service; \$17.22 for single family units and \$25.87 for duplex units. All other users are charged for wastewater service based on water consumption. The rates range from \$0.8600 to \$3.7556 per 1,000 gallons of water consumption. Wastewater service rates as a function of water consumption have been established based on the estimated proportion of water returned to the sewer and strength of the wastewater.

### **Connection Fee**

As described above for water service, the City charges a Sanitary Sewer and Water Capacity Fee for new connections to the water and wastewater systems to pay for existing capacity investment. The charges are based on a base single family dwelling unit referred to as an Equivalent Dwelling Unit (EDU). The charges for users other than single family dwelling units are calculated in terms of EDU's. The current connection fee is \$2,077.00 per EDU; 55 percent (\$1,142.35) of which is for wastewater capacity. Connection charges will cover the cost of providing wastewater service to development in areas with existing wastewater facilities. Connection fees will provide adequate financing for wastewater service to some of the Tier I areas, but in general will not meet the capital requirements for providing wastewater service to future development areas.





## **Capital Improvements**

Costs for major wastewater system capital improvements for service to the existing service area are financed by long term debt which is repaid from wastewater service charge and connection fee revenue.

The method of financing capital costs of facilities to provide wastewater service to areas presently not within the existing service area will either be through formation of an assessment district, funding by a developer, or other method.

Operation and maintenance costs are financed by revenue from wastewater service charges.

## **CONCLUSIONS**

The City presently provides water treatment and distribution service and wastewater collection, treatment, and disposal service to existing development within the city limits in accordance with regulatory requirements and national standards and at a cost to users consistent with other agencies in Southern California. The City can provide water and wastewater service to planned development areas within its proposed expanded Sphere of Influence by expansion of the existing facilities.

From the costs developed in the Service Area Plan, the average total annual cost for water service for future development over the 20 year planning period is projected to be \$445 or \$37 per month, in present dollars not including commercial and industrial contributions. Considering commercial and industrial water service fees, the total cost to residential users would be approximately \$312 per year or \$26 per month. The present cost of water service for single family residences is approximately \$280 per year or \$23 per month.

From the costs developed in the Service Area Plan, the average total annual cost for wastewater service for future development over the 20 year planning period is projected to be \$375 or \$31 per month, in present dollars not including commercial and industrial contributions. Considering commercial and industrial wastewater service charges, the total cost to residential users would be approximately \$225 per year or \$19 per month. From Section 4, the present wastewater service charge for single family dwelling units is \$17.22 per month or \$207 per year.

Based on the information developed in this Service Area Plan and in the Water and Sewer Master Plan Updates, the City will be able to provide water and wastewater service to the 1990 General Plan future development areas in accordance with present service levels and costs.



## **SECTION 1**

### **INTRODUCTION**



# **SECTION 1**

## **INTRODUCTION**

This Service Area Plan for Water and Wastewater Services has been prepared in accordance with the requirements of Imperial County Local Agency Formation Commission in support of a request by the city of El Centro to expand its Sphere of Influence. The Service Area Plan addresses water and wastewater services; other services are addressed separately from this document.

### **BACKGROUND**

The city of El Centro (City) is located in the Imperial Valley of Imperial County, California. The incorporated area of the City presently covers approximately 5,900 acres. The City recently completed annexation of five areas totaling approximately 1,900 acres. The present population of the City is estimated to be 36,450 (Reference 1). The City provides water treatment and distribution service and wastewater collection, treatment, and disposal service within the City limits and will provide these services to future annexations. The City also provides water and wastewater services to the Imperial County Center facilities south of the City at the southeastern corner of the intersection of McCabe Road and Clark Road.

The Imperial County Local Agency Formation Commission (LAFCO) is responsible for establishing service area boundaries for public agencies in Imperial County. The potential ultimate service area boundary for an agency is referred to as its sphere of influence. The City's Sphere of Influence, established by LAFCO in 1977, covers a total area of approximately 11,600 acres including the incorporated area of the City and adjacent unincorporated land (approximately 5,700 acres). Unincorporated portions of the Sphere of Influence may eventually be annexed to the City.

The present Sphere of Influence is bounded by:

- Imperial Irrigation District's Central Drain on the north;
- Austin Road on the west;
- State Highway 111 on the east; and
- Interstate 8, Danenberg Road, the City Water Treatment Plant, and Wake Avenue on the south.

The City's 1990 General Plan covered areas to the south beyond the present Sphere of Influence. The southern boundary for the 1990 General Plan area extended to McCabe Road. The City is proposing an expansion of its Sphere of Influence. On the south, the revised Sphere would extend to McCabe Road consistent with the General Plan planning area. On the east, the expanded Sphere would extend to the quarter section line east of Highway 111. The approximately 2,300 foot expansion east of Route 111 was not





covered in the 1990 General Plan but is presently planned as a potential transportation corridor. The proposed expanded Sphere of Influence covers an area of approximately 17,500 acres.

## **STUDY AREA**

For the purposes of this Service Area Plan, the Study Area is established as the proposed expanded Sphere of Influence excluding the incorporated area of the City prior to the recent annexations. The recently annexed 1,900 acres is included in the Study Area because, in general, it is presently not provided with City water and sewer services (Reference 5).

Figure 1 shows the present city limits, present Sphere of Influence, and the proposed expanded Sphere of Influence.

## **PURPOSE OF SERVICE AREA PLAN**

This Service Area Plan has been prepared in accordance the requirements of Imperial LAFCO to be submitted with the City's Sphere of Influence Plan for the expanded Sphere of Influence. As required by Imperial LAFCO, the Service Area Plan addresses the following specific issues associated with the ability of the City to provide water and wastewater service in the expanded Sphere of Influence:

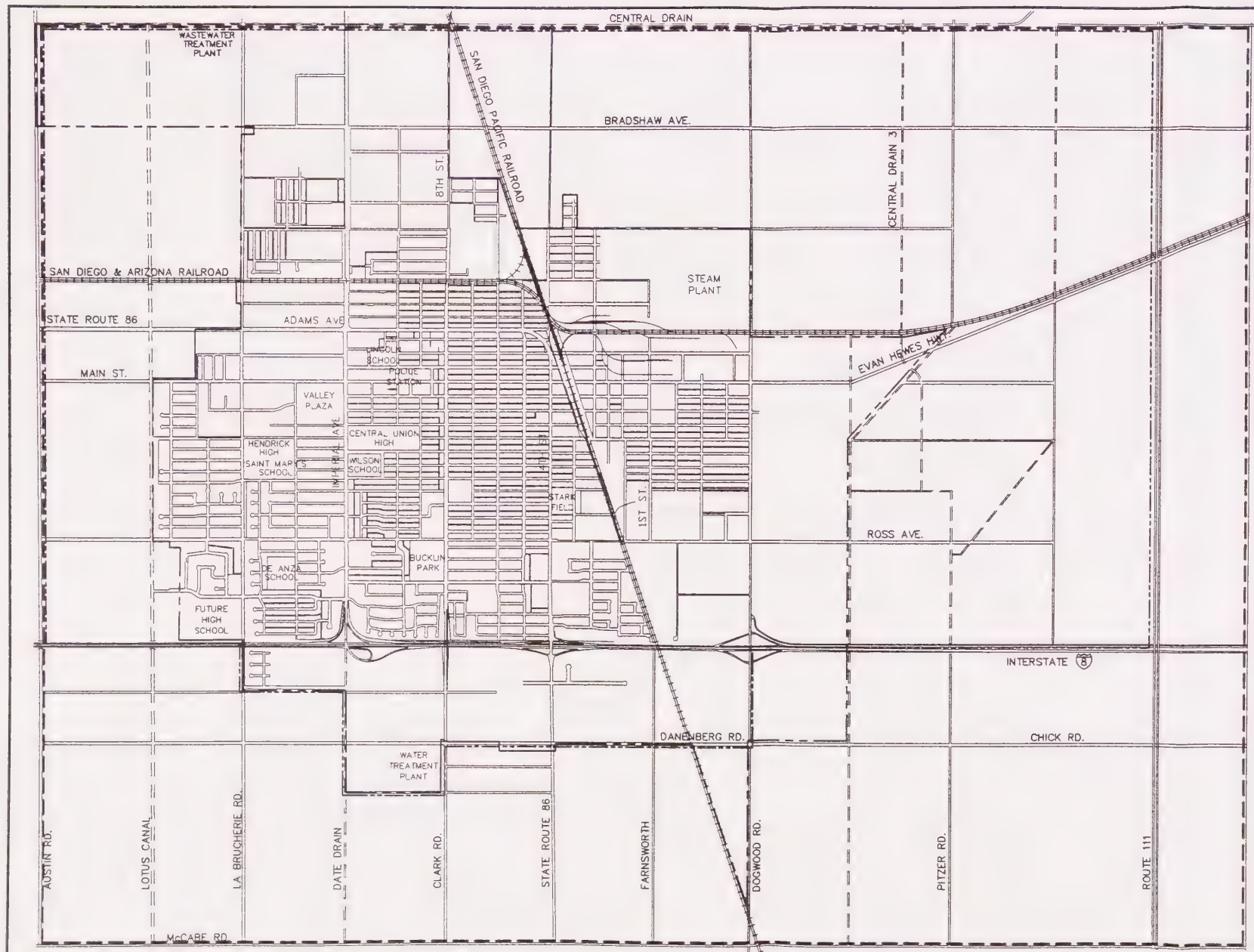
- a. A projection of the geographic extent of service capabilities during the next 20 years delineated in 5 year increments. In the case of cities, a shorter time frame may be appropriated if the applicable general plan has a shorter planning period.
- b. Projected level of service capabilities in the same time frames and geographic areas.
- c. Actual and projected costs of services to consumers. This shall include a statement of actual and projected allocation of the cost of services between existing and new residents.
- d. The "Service Area Plan" shall contain sufficient information concerning current and projected capital programs, revenues, costs, rate structures and financing, and other information necessary to support the projected service capabilities and areas set forth in the Plan.

This document is an attachment to the application for expansion of Sphere of Influence being submitted by the City to Imperial LAFCO for the area described above and shown on Figure 1.

## **PLANNING PERIOD**

In accordance with Imperial LAFCO requirements, the planning period for this Service Area Plan is established as the 20 year period from the year 1995 to the year 2000. The planning period is subdivided into the following five year periods: 1995 to 2000; 2000 to 2005; 2005 to 2010; and 2010 to 2015.





# LEGEND

- STUDY AREA
- SPHERE OF INFLUENCE
- CITY LIMITS



0 1250 2500

SCALE: 1" = 2500'

FIGURE 1

STUDY AREA



## **REFERENCE DOCUMENTS**

The documents discussed below were utilized in the preparation of this Service Area Plan.

### **1990 General Plan for City of El Centro**

The current General Plan for the City was prepared in 1990 (Reference 1). The General Plan recommended a land use program for future expansion of the City in two phases of development. Phase I would occur in already settled areas and in undeveloped areas adjacent to existing development. Once development within Phase I approaches capacity, development would be permitted in contiguous Phase II areas by City council action.

### **Water Master Plan Update**

The Water Master Plan for the City was updated in September 1994 (Reference 2). The Water Master Plan Update evaluated the capacities of the City's existing water treatment and distribution facilities to meet current and projected future water demands. The Water Master Plan Update identified improvements to the existing water treatment and distribution system necessary to provide adequate water service to the existing service area. The Water Master Plan Update also identified capital improvements to provide water service to project ultimate future development in accordance with the 1990 General Plan.

### **Sewer Master Plan Update**

The Sewer Master Plan for the City was updated in September 1994 (Reference 3). The Sewer Master Plan Update evaluated the capacities of the City's existing wastewater collection and conveyance system to provide adequate wastewater service to existing development within the City and to projected ultimate future development within the 1990 General Plan planning area. The Update evaluated collector and trunk sewer capacities and lift station and forcemain capacities. Capacity planning for the wastewater treatment facilities was not considered in the Sewer Master Plan Update but was previously evaluated separately.

### **Draft of Preliminary Urban Development Program**

A preliminary draft of a proposed strategy for urban development within the City's General Plan planning area was submitted to the City in October 1994 (Reference 4). The proposed urban development strategy would replace the Phase I and Phase II growth program of the 1990 General Plan. The proposed urban development program is based on a system of tiered planning areas. The tiered areas have been established based on the degree of availability of services. Tier areas requiring the least infrastructure improvements would be expected to develop sooner than areas requiring significant infrastructure improvements.





## **SECTION 2**

### **PROJECTED GEOGRAPHICAL EXTENT OF WATER AND WASTEWATER SERVICE CAPABILITIES**



## **SECTION 2**

### **PROJECTED GEOGRAPHICAL EXTENT OF WATER AND WASTEWATER SERVICE CAPABILITIES**

The City provides water and wastewater service within its present city limits. The City also provides water and wastewater service to the Imperial County Center facilities south of McCabe Road on Clark Road. The City will provide water and wastewater service to the recent annexation areas as required by connection to existing available services or extension of existing services (Reference 5). The projected extent of the water and wastewater service capabilities is based on the 1990 General Plan, the Water and Sewer Master Plan Updates, and the Draft Preliminary Urban Development Program.

#### **PLANNING AREA FOR 1990 GENERAL PLAN**

The planning area of the 1990 General Plan covered the area bounded as follows:

- Imperial Irrigation District's Central Drain on the north;
- Austin Road on the west;
- State Highway 111 on the east; and
- McCabe Road on the south.

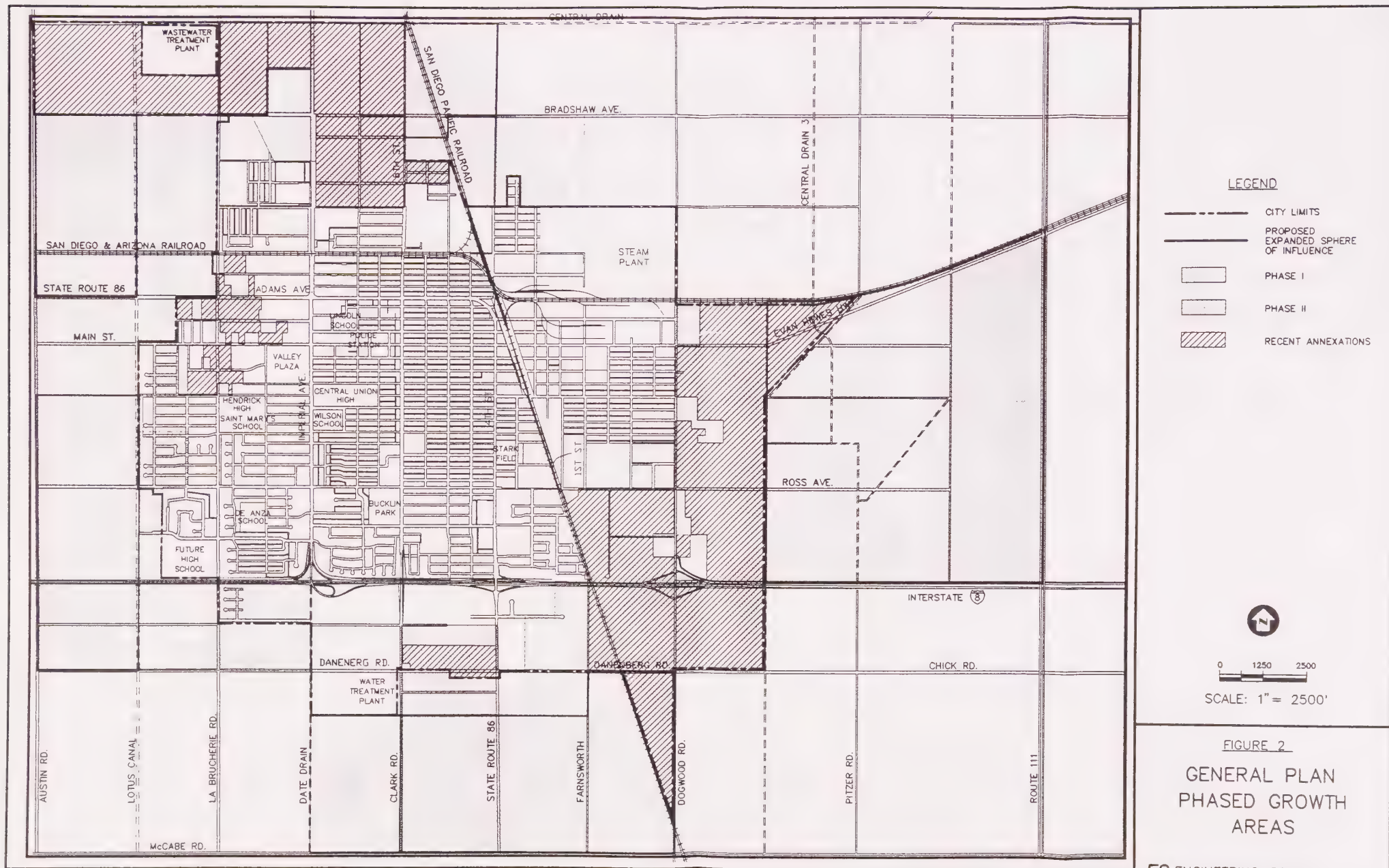
In the 1990 General Plan, it was proposed that growth of the City take place in two phases:

- Phase I expansion would occur in already developed areas or in undeveloped areas that are adjacent to existing development. Phase I would accommodate 31,750 additional people.
- As development in Phase I approaches capacity, expansion into contiguous areas (Phase II) would be permitted following appropriate City Council action. Phase II would accommodate 19,700 additional people.

Coupled with limited development and redevelopment within the incorporated portion of the Study Area (1,440 additional people), the Phased Growth Plan would allow an ultimate population increase of 52,890 within the Study Area. The Phase I and Phase II planning areas did not cover the entire 1990 General Plan area. The General Plan provided for urban development of most of the overall planning area within the Phase I and Phase II planning areas. Areas within the General Plan area but outside of the Phase I and Phase II areas were planned for agriculture and related businesses and very low residential development.

Figure 2 shows the General Plan planning area, including the Phase I and Phase II development areas.









## **PLANNING AREA FOR WATER AND SEWER MASTER PLAN UPDATES**

The General Plan Phase I and Phase II development area was adopted as the future ultimate service area for the Water and Sewer Master Plan Updates. On-site water and wastewater service would be required for low density development within the overall General Plan study area but outside of the Phase I and II urban development areas.

## **PLANNING AREA FOR PRELIMINARY URBAN DEVELOPMENT PROGRAM**

The Draft of Preliminary Urban Development Program proposes a development strategy based on tiered areas as follows:

- Development Tier I - Tier I areas are generally adjacent to the existing city limits and could be provided with water and wastewater service by the extension of existing facilities.
- Development Tier II - Tier II areas are also generally adjacent to existing City limits but differ from Tier I areas in that public infrastructure to serve new development is more limited.
- Development Tier III - Development of Tier III areas will generally require a greater investment in public infrastructure to accommodate new development than would be required for development in Tiers I or II. Until financing for such infrastructure can be provided, development within Tier III is expected to be limited to agriculture and related businesses, very low density residential, public facilities, and uses which do not require water treatment and sewage disposal or which could provide these facilities on-site.
- Development Tier IV - The Tier IV areas are presently planned to remain in agricultural and agriculture-related uses and very low density residential. Development in these areas would utilize on-site water and wastewater facilities.

Tier I would accommodate approximately 3,900 dwelling units (13,260 persons), Tier II approximately 2,770 dwelling units (9,420 persons), and Tier III approximately 11,360 dwelling units (39,300 persons). No estimate is made for Tier IV population capacity. The total Tier I through III population projection of 61,980 is greater than the 1990 General Plan Phase I and Phase II ultimate additional population projection of 52,890.

The Draft of Preliminary Urban Development Program covers the proposed expanded Sphere of Influence, which as noted above, is the same planning area as the 1990 General Plan plus an additional half section (approximately 2,300 feet) to the east of Highway 111.

The combined Tier I, II, and III area corresponds to the combined Phase I and II areas and the 1994 annexation area with the following exceptions:

- The northeast, southeast, and southwest quarter sections around the intersection of Interstate 8 and Highway 111 are included in Tier III but were not included in Phase I or II.



- A portion of the area south of the projection of Bradshaw Road east of the railroad tracks is not included in Tiers I through III but was included in Phase I.
- The area between Lotus Canal and the extension of Imperial Avenue south of the projection of Danenberg Road to the south limit of the water treatment plant is included in Tier I but was not included in Phase I or II.

Since the additional tiered areas are relatively small and contiguous with the phase growth planning areas, water and wastewater services could be provided to the tiered urban development areas outside of the Phase I and Phase II from the proposed future facilities in accordance with the 1994 Water and Sewer Master Plan Updates.

As discussed above, the Water and Sewer Master Plan Updates were based on the 1990 General Plan planning area and did not include the additional area to the east of Highway 111. However, this area could also be provided with water and wastewater service from the proposed facilities along the Highway 111 corridor.

Figure 3 shows the proposed tiered planning areas.

## **PROJECTED EXTENT OF WATER AND WASTEWATER SERVICE**

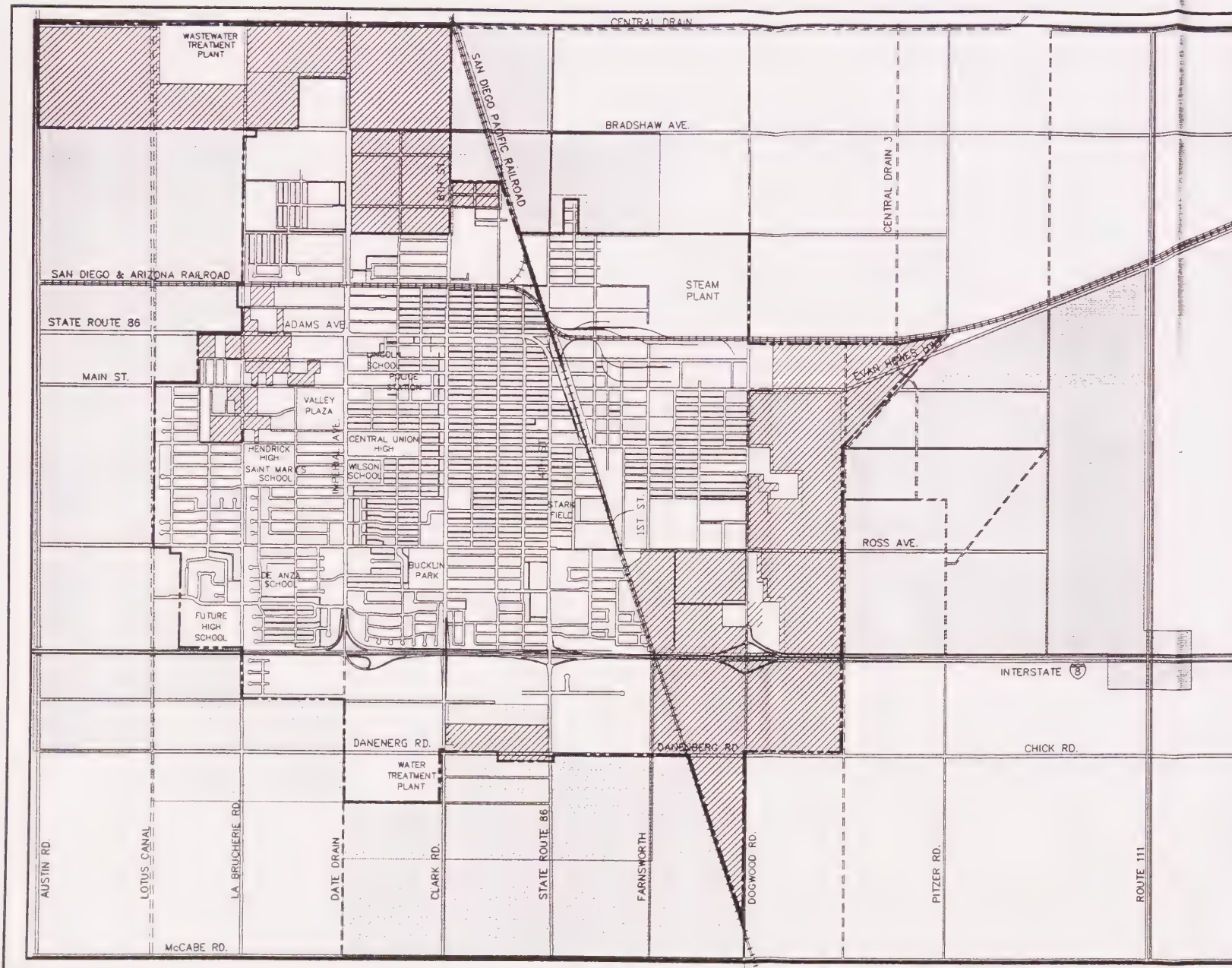
For the purposes of this Service Area Plan, the projected water and wastewater service area is the Draft of Preliminary Urban Development Program Tier I through Tier IV planning areas. The tiered development area is established as the projected ultimate water and wastewater service area on the basis that the Preliminary Urban Development Program will be adopted and that very low density development within the Study Area but outside of the tiered urban development area will utilize on-site water and wastewater facilities. As noted above, the water and sewer master plan updates are based on the General Plan Phase I and Phase II urban development areas. Since the tiered growth area generally corresponds to the phased growth area, the water and sewer master planning may be directly applied to the tiered growth development area.

Based on a present population of 36,450 and an average annual growth rate of 3.15 percent, the projected population of the City in five year increments is as follows:

<u>Year</u>	<u>Projected Population</u>	<u>Population Increase</u>	<u>Cumulative Increase</u>
1995	36,450	-	-
2000	42,600	6,150	6,150
2005	49,700	7,100	13,250
2010	58,000	8,300	21,550
2015	67,800	9,800	31,350







# LEGEND

- CITY LIMITS
- PROPOSED EXPANDED SPHERE OF INFLUENCE
- TIER I CURRENT URBAN SERVICE AREA
- TIER II PLANNED URBAN SERVICE AREA
- TIER III FUTURE URBAN SERVICE AREA
- TIER IV URBAN SERVICE STUDY AREA
- ▨ RECENT ANNEXATION



0 1250 2500

SCALE: 1" = 2500'

FIGURE 3

## PROPOSED URBAN DEVELOPMENT PROGRAM TIER AREA

ES ENGINEERING-SCIENCE





Therefore, over the 20 year planning period, approximately 50 percent of the Tier I through III ultimate population will be realized based on historic growth patterns (31,350 additional by 2015 of 61,980 estimated ultimate additional). If the growth through the year 2015 follows the tiered strategy sequence, all of Tiers I and II will be developed and approximately 20 percent of Tier III will be developed by the year 2015.

The City has recently annexed approximately 1,900 acres. The annexation areas include portions of Tiers I, II, III, and IV. In general, these areas are not provided with water and wastewater service but are proposed to be connected to existing adjacent or extended facilities. For the purpose of this Service Area Plan, it is assumed that these areas will be developed in accordance with the Urban Development Program.

The projected development of Tiers I through III over the next 20 years in five year increments is as follows:

<u>Year</u>	<u>Estimated Population</u>	<u>Projected Increase</u>	<u>Cumulative Increase</u>	<u>Approximate Percent Developed</u>		
				<u>Tier I</u>	<u>Tier II</u>	<u>Tier III</u>
1995	36,450	-	-	-	-	-
2000	42,600	6,150	6,150	40	10	0
2005	49,700	7,100	13,250	70	20	5
2010	58,000	8,300	21,550	90	60	10
2015	67,800	9,800	31,350	100	100	20

These projections will be used in Sections 3 and 4 to estimate incremental costs of providing water and wastewater service for future development areas.



## **SECTION 3**

### **PROJECTED WATER SERVICE CAPABILITIES, COSTS, AND FINANCING**



## **SECTION 3**

### **PROJECTED WATER SERVICE CAPABILITIES, COSTS, AND FINANCING**

#### **LEVEL OF SERVICE CAPABILITIES**

##### **Existing Service Capabilities**

The City provides water treatment and distribution service within the city limits and to Imperial County Center facilities south of McCabe Road on Clark Road. The City owns and operates a water treatment plant which provides clarification, filtration, and disinfection of Colorado River water. Raw water is delivered to the plant through the Imperial Irrigation District (IID) All American Canal and Date Canal. Treated water is pumped from storage tanks to users through a grid of distribution pipelines and water mains.

##### **Water Treatment Facilities**

The existing water treatment facilities were constructed in the late 1950's, expanded in the early 1980's, and presently consist of the following:

- A raw water supply pipeline from the IID Date Canal on the east side of the plant with a capacity of 20.7 million gallons per day (mgd).
- An alternate raw water supply line from the IID Dahlia Lateral No. 1 with a delivery capacity of 22.5 mgd.
- A raw water pump station capable of pumping a total of 24.1 mgd into the raw water storage reservoirs, and also able to pump raw water out of the storage reservoirs and into the treatment plant at 24.1 mgd in the event that both canal supplies are shut-off.
- Two asphalt-lined, earthen-levee raw water storage reservoirs, each with a storage capacity of 30 MG for a total capacity of 60 MG.
- Two circular solids contact clarifiers, each with a capacity of 8.5 mgd for a total capacity of 17.0 mgd.
- Three anthracite and sand dual media gravity filters with a total capacity of 14.2 mgd.
- Treated water transfer pump station with a total duty capacity of 14.4 mgd plus standby capacity of 7.2 mgd to pump treated water to storage.
- Treatment chemical storage and feed facilities.

The water treatment plant is located on the south side of town west of Clark Road.





## **Treated Water Distribution System**

The existing water distribution system is a single pressure zone, completely pumped system with off-line storage. Treated water storage and distribution facilities consist of the following:

- Three treated water storage reservoirs at the water treatment plant site having a total storage capacity of 10 MG.
- A 12,000 gallon per minute (gpm) main pump station located at the treatment plant which pumps treated water from storage into the distribution system.
- A remote storage reservoir of 5.0 MG capacity which receives treated water from the distribution system and stores it for domestic reserve and fire flow demand.
- A 3,500 gpm pump station with 3,500 gpm standby capacity at the remote storage reservoir site which pumps treated water from storage back into the distribution system.
- A transmission pipeline from the water treatment plant to the center of the existing service area.
- Other transmission and distribution pipelines and water mains.
- Two elevated storage tanks which are presently not in use.

The remote storage tank and pump station are located on the west side of La Brucherie Road between Barbara Worth Avenue and Main Street. Distribution pipelines and water mains are located in a grid throughout the City.

## **Capacity of Existing Facilities for Present Service Area**

The City recently completed a water system capital improvement project which increased treated water storage capacity and distribution pumping capacity. The project also increased the water pressure in the system which has improved distribution capacity of the water main system.

The Water Master Plan Update identified additional improvements to the existing water facilities to increase the reliability of the filtration and distribution pumping systems and to replace a few existing water mains with larger pipelines to improve distribution. Based on the results of the Water Master Plan Update, the existing raw water storage and treatment facilities have adequate capacity to meet the demands of the existing service area and several years of future development. Existing treated water storage is adequate for eight years of projected growth and present distribution pumping capacity is adequate for four years of projected growth.

## **Existing Service Capabilities Within Study Area**

The Imperial Water District supplies Colorado River water to Imperial County through an extensive canal system. Water supplied by IID is primarily for agricultural uses. IID also supplies raw water to cities and water districts which treat and distribute the water



for potable uses within their service areas. IID currently provides limited water service directly to unincorporated properties within the City's Sphere of Influence. Water supplied directly by IID to County properties is not treated and is for nonpotable uses.

Properties outside the City limits have the option to tie into the City's existing water distribution system for either potable water service or for fire prevention. Connection of County properties to the City water system is only practical where water mains are located in the vicinity of the property. Water rates for properties outside the City are higher than for properties located within the City jurisdiction.

It has been determined that there is a need to provide potable water service within the unincorporated areas of Imperial County. IID is conducting discussions with various agencies within the County to determine the best approach to providing potable water service to unincorporated areas of the County.

### **Projected Service Capabilities Within Study Area**

The Water Master Plan Update is based on ultimately providing potable water service for all areas within the Phase I and Phase II planning areas (Tiers I through III). Water service for very low density residential development outside of the Phase I and Phase II service areas but within the Study Area, will be through the use of individual on-site treatment systems or as otherwise determined for serving rural development in Imperial County.

Due to the relatively flat topography of the region, water service can be extended to the future development service area by providing additional treatment and storage capacity and expanding the water distribution pipeline distribution pipeline grid of the existing single pressure zone distribution system. The single pressure zone will be able to serve the ultimate service area. Expansion of the water treatment facilities and treated water storage capacity could occur at the site of the existing facilities or at other appropriate sites.

Therefore, extending water service to the ultimate service area will involve projection of the existing system to the future service area consistent with the same level and type of facilities utilized for the existing service area.

## **COST OF WATER SERVICES**

### **Capital Costs**

The 1994 Water Master Plan Update identified required capital improvements to the water treatment and distribution facilities to maintain service levels to the existing service area and to provide service to future development areas. In general, the improvements identified in the Water Master Plan Update are required to provide capacity for future development.



The required capacity improvements can be grouped into two categories:

1. Raw water storage, treatment facilities, treated water storage, and water distribution pumping.
2. Distribution pipelines.

The costs for treatment, storage, and pumping capacity are independent of the location of the development requiring water service. Due to the nature of the City's water distribution system (single pressure zone and off-line storage), the requirements for distribution pumping and storage are the same throughout the existing and proposed future service area. From the Water Master Plan Update, costs and timing of treatment and storage upgrades required to accommodate projected future development are itemized in Table 3.1 (Reference 2).

Total costs for water distribution pipelines to serve future development areas are presented in Table 3.2 (Reference 2). The costs for distribution pipelines depend on the location of the development relative to existing facilities. The estimated costs of the distribution pipelines required for the ultimate development condition as presented in the Water Master Plan Update have been segregated and assigned to the corresponding Tier I, II, and III service areas. This cost breakdown is based on the fact that the tiers were developed as a function of the ability to provide utility services to these areas. The cost estimate breakdown for distribution pipelines to serve ultimate development of the Tier I, II, and III areas is as follows:

<u>Development Area</u>	<u>Cost</u>	<u>Dwelling Units</u>	<u>Unit Cost<sup>a</sup></u>
Tier I	\$3.0 million	3,900	\$538/dwelling unit
Tier II	\$4.1 million	2,770	\$1,036/dwelling unit
Tier III	<u>\$8.6 million</u>	<u>11,360</u>	\$536/dwelling unit
Total	\$15.7 million	18,030	\$876/dwelling unit

<sup>a</sup> Actual cost will be less with contribution from commercial/industrial development within tier.

Capital costs for the distribution pipelines in five year increments for the 20 year planning period were developed based on the estimated percent development of each tier, as established in Section 2, multiplied by the total ultimate distribution pipelines cost for that tier as listed above. Total estimated capital costs for water treatment and distribution facilities to serve future development in the five year increments over the 20 year planning period are presented in Table 3.3. These costs only include those costs projected to be incurred during the 20 year planning period from 1995 to 2015. Development beyond the 20 year planning period and costs to provide water service to that development are not addressed in this Service Area Plan. Therefore, the 20 year planning period costs do not correspond to the ultimate planning costs presented in the Water Master Plan Update.





Table 3.1

**Summary of Recommended Treatment, Storage, and Pumping Improvements and Suggested Phasing**

Fiscal Year	Recommended Improvement (year required) <sup>a</sup>	Estimated Cost <sup>b</sup> (\$1,000)
1995/96	WTP standby pump upgrade (1995) <sup>c</sup>	\$250
	La Brucherie Road 27-inch main	\$490
	Date Drain/Danenberg Rd. parallel mains	<u>\$325</u>
	Total 1995/96	\$1,065
1996/97	Standby filter backwash pump (1995) <sup>c</sup>	\$200
	Spare filter (1995) <sup>c</sup>	\$1,400
	7.4 mgd filter (1998)	<u>\$1,600</u>
	Total 1996/97	\$3,200
1997/98	30 MG raw water storage reservoir (1998)	\$2,100
1998/99	3,500 gpm remote pump (1999)	\$100
	Ross Avenue 12-inch connection <sup>c</sup>	\$20
	4th Street 12-inch main <sup>c</sup>	<u>\$100</u>
	Total 1998/99	\$220
2003	5.0 MG remote storage tank (2003)	\$1,000
2005	4,000 gpm WTP distribution pump (2005)	\$250
2011	30 MG raw water storage reservoir (2011)	\$2,100
	7.4 mgd filter (2011)	<u>\$1,600</u>
	Total 2011	\$3,700
2012	5,000 gpm WTP distribution pump (2012)	\$700
2013	5.5 MG treated water storage (2013)	\$1,500
2017	4,000 gpm distribution pump capacity	<u>\$500</u>
	Total Improvements	\$14,200

<sup>a</sup> Improvements to water treatment facilities address raw water storage and filtration.

<sup>b</sup> ENR Construction Cost Index 6510, April 1994.

<sup>c</sup> Recommended improvement for existing service area.





Table 3.2

**Estimated Costs for Future Water Distribution System Pipelines  
for Ultimate Service Area**

Development Area	Diameter (inch)	Length (feet)	Unit <sup>a</sup> Cost (\$/ft)	Total Cost (\$1,000)
South	30	18,600	\$110	\$2,050
	27	1,500	\$100	\$150
	18	11,000	\$75	\$830
	12	47,700	\$60	\$2,860
West	24	14,600	\$90	\$1,310
	12	38,500	\$60	\$2,310
North	24	14,100	\$90	\$1,270
	18	7,300	\$75	\$550
	12	14,100	\$60	\$850
East	30	300	\$110	\$30
	27	8,000	\$100	\$800
	18	2,300	\$75	\$170
	12	42,600	\$60	<u>\$2,560</u>
Total for Future Water Distribution Pipelines				\$15,740

<sup>a</sup> ENR Construction Cost Index 6510, April 1994.



**Table 3.3**  
**Estimated Cost of Water Service**  
**for Future Development**  
**(\$1,000<sup>a</sup>)**

Year	2000	2005	2010	2015	Total
Raw Water Storage	\$2,100	\$0	\$2,100	\$0	\$4,200
Treatment Facilities	\$3,200	\$0	\$1,600	\$0	\$4,800
Treated Water Storage	\$0	\$1,000	\$0	\$1,500	\$2,500
Distribution Pumping	\$350	\$250	\$0	\$700	\$1,300
Distribution Pipelines					
Tier I	\$1,200	\$900	\$600	\$300	\$3,000
Tier II	\$410	\$410	\$1,640	\$1,640	\$4,100
Tier III	<u>\$0</u>	<u>\$430</u>	<u>\$430</u>	<u>\$860</u>	<u>\$1,720</u>
Subtotal	<u>\$1,610</u>	<u>\$1,740</u>	<u>\$2,670</u>	<u>\$2,800</u>	<u>\$8,820</u>
Total	\$7,260	\$2,990	\$6,370	\$5,000	\$21,620
Unit Costs					
No. of Dwelling Units	1,800	2,080	2,430	2,870	9,180
Cost per Dwelling Unit <sup>b</sup>	\$4,030	\$1,440	\$2,620	\$1,740	\$2,360

<sup>a</sup> ENR Construction Cost Index 6510, April 1994.

<sup>b</sup> Actual cost will be less with contribution from commercial/industrial development.



Table 3.3 includes an approximation of the capital cost per dwelling unit for water service for each of the five year increments over the 20 year planning period. The total cost for the period ending in the year 2000 is higher than the total for the other periods because of raw water storage and treatment capacity costs projected to be incurred that period. The cost of these capacity additions will actually be repaid by development in later periods. The overall cost per dwelling unit over the 20 year planning period is approximately \$2,360; which is the \$21.6 million estimated cost through 2015 divided among a projected additional 9,180 dwelling units by 2015. These costs do not include financing costs.

The unit costs discussed above are based on only residential development. Additional revenue will be realized from future commercial and industrial users. Presently, commercial and industrial water use is approximately 30 percent of the total water demand in the City. If the future service area develops with similar commercial/industrial demands, the overall capital cost per dwelling unit will be \$1,700.

The costs per dwelling unit presented in Table 3.3 and discussed above are intended to provide a general estimate of the capital cost per dwelling unit for water facilities to serve future development. A rate study would be required to establish actual connection fees and water rates. As discussed below, capital costs for the water system are financed through various means. Depending on the methods of financing, these costs will be passed on to the user directly or indirectly in the form of user fees, connection fees, and housing costs. Costs for wastewater service for commercial and industrial users will be passed on to residents in the form of costs for goods and services.

### **Operation and Maintenance Costs**

The City's 1995 budget for operation and maintenance of the water treatment and distribution system is approximately \$3.0 million. This operation and maintenance budget is the total water utility budget less repayment of debt. Excluding contributions from commercial and industrial users, this annual operation and maintenance cost represents an average annual cost of approximately \$280 per single family residential dwelling unit.

It is projected that water operation and maintenance costs will increase in proportion to water demand which will increase in direct proportion to population growth. Therefore, the unit cost of operation and maintenance per user will remain at present levels, not considering inflation. Based on the above, the projected water system operation and maintenance budgets for the next 20 years in five year increments, in present value dollars, are as follows:

<u>Projected Annual Year</u>	<u>Operation and Maintenance Cost</u>
2000	\$3.5 million
2005	\$4.1 million
2010	\$4.8 million
2015	\$5.6 million





## **Debt Repayment**

The City is repaying long term debt for completed capital improvement projects. As described below, this debt is repaid from annual water sales and connection fee revenue. Present annual debt repayment costs are \$317,579, or \$30 per dwelling unit excluding commercial and industrial contributions.

## **Projected Allocation of Cost of Water Service**

Allocation of costs for the water treatment and distribution service between existing and new residents will be in accordance with the following:

- Costs for additional capacity for raw water storage, treatment, treated water storage, and treated water pumping required to provide service to new development will be paid by the new development through connection fees and water usage charges.
- Costs for water distribution mains to serve new development will be paid by new development through assessment district financing or developer financing. Costs for water distribution pipelines serving more than one development will be shared accordingly.
- Costs for capital improvements to maintain service to the existing service area will be paid by existing users through monthly usage charges.
- Costs for capital improvements to upgrade facilities to meet new regulatory requirements will be paid by all users through monthly usage charges.
- Operation and maintenance costs will be paid by all users through monthly usage charges.

## **FINANCING OF WATER SERVICES**

### **Present Water Service Rates and Charges**

Nearly all of the annual water utility revenue is from water sales income. The water usage charge is presently \$1.10 per 1,000 gallons and will increase to \$1.15 per 1,000 gallons effective July 1995 and to \$1.20 per 1,000 gallons effective July 1996. Beginning July 1995, a monthly service charge will be applied to all services based on water meter size. The monthly service charge will range from \$1.69 to \$29.46 and will increase to \$1.87 to \$30.31 in 1997. Most residential users will pay the minimum water meter charge.

### **Connection Fee**

The City charges a Sanitary Sewer and Water Capacity Fee for new connections to the water and wastewater systems to pay for existing capacity investment. The charges are based on a base single family dwelling unit referred to as an Equivalent Dwelling Unit (EDU). The charges for uses other than single family dwelling units are calculated in terms of EDU's. The current connection fee is \$2,077.00 per EDU; 45 percent (\$934.65) of which is for water capacity. Connection charges will cover the cost of providing water service to development in areas with existing water facilities. Connection fees will



provide adequate financing for water service to some of the Tier I areas, but in general will not meet the capital requirements for providing water service to future development areas.

## **Capital Improvements**

### **Existing Service Area Improvements**

Costs for major water system capital improvements for service to the existing service area have historically been financed by long term debt which is repaid from water sales and connection fee revenue.

### **New Service Area Improvements**

The method of financing capital costs of facilities to provide water service to areas presently not within the existing service area will either be through formation of an assessment district, funding by a developer, or other method. Assessment districts may be used to provide for facilities which have city-wide or regional benefit. Typically more than one property owner pays into an assessment district via local tax collection.

Public facility improvements also may be directly funded and/or constructed by developers. The Subdivision Map Act contains provisions which allow the City to require the installation of public facilities as a condition of approval of a tentative map under the City's development review process. Developer funding and construction of water mains within the developed area is common. Developers may also be required to fund off-site water system improvements as a condition of tentative map approval.

## **Operation and Maintenance**

Operation and maintenance costs are financed by revenue from water usage charges and meter charges.



## **SECTION 4**

### **PROJECTED WASTEWATER SERVICE CAPABILITIES, COSTS, AND FINANCING**





## SECTION 4

# PROJECTED WASTEWATER SERVICE CAPABILITIES, COSTS, AND FINANCING

### LEVEL OF SERVICE CAPABILITIES

#### Existing Service Capabilities

The City provides wastewater collection, treatment, and disposal service within the city limits and to the Imperial County Center facilities south of McCabe Road on Clark Road. The City owns and operates a wastewater treatment plant which provides secondary level treatment of wastewater from the service area and discharges treated wastewater to the Alamo River. The City owns and operates a wastewater collection and transmission system which is comprised of collector sewers, trunk sewers, lift stations, and force mains.

#### Wastewater Collection and Conveyance System

**Sewers.** The City's sewer system includes approximately 84.3 miles of gravity sewers ranging in diameter from 4- to 30-inch. Collector and lateral sewer mains are generally 8-inch diameter and trunk sewers range from 10- to 27-inch diameter. In total, there are approximately 67 miles of collector and lateral sewers and 17 miles of trunk sewers. Generally, the collector sewers are aligned east-west and carry flow easterly to north-south aligned trunk sewers which carry flow to the north. An interceptor sewer is aligned generally east-west at the north end of the City and receives flow from the trunks and from a lift station and carries it west to a lift station which pumps into the treatment plant at the northeast corner of the service area. The oldest pipelines in the system were placed into service in the early 1900's; most of the existing collector sewers were installed after 1950.

**Lift Stations and Force Mains.** The City's sewer system includes three major lift stations and six minor lift stations and 1.7 miles of forcemains ranging in diameter from 4- to 27-inch. The three major lift stations are the Main Lift Station which pumps to the treatment plant, Lift Station No. 3 which pumps to the treatment plant, and the Eastside Lift Station which pumps to the interceptor sewer which flows to the Main Lift Station.

The lift stations vary in capacity, age, and type of construction and can be grouped in three categories:

1. The Main Lift Station is of cast-in-place concrete construction, with a separate wet well, dry well, and motor room.
2. The Eastside Lift Station is a circular lift station incorporating a dry well in one half of the circular ring and a wet well in the other half.



3. All of the other lift stations, including Lift Station No. 3, are pre-fabricated type with a steel or fiberglass housing for the mechanical and electrical equipment and a separate concrete wet well.

### **Wastewater Treatment Facilities**

The City Wastewater Treatment Plant provides secondary treatment of all wastewater from the City service area. The existing treatment plant has a capacity of 6.3 mgd. A capital improvement project is presently underway which will increase the capacity of the plant to 8.0 mgd. The treatment plant is located west of La Brucherie Road, adjacent to the Central Drain.

The City is planning a second wastewater treatment plant to meet wastewater treatment needs beyond the capacity of the expanded existing plant. The second treatment plant is presently planned to have an initial capacity of 4 mgd with a future expansion of 4 mgd for a total additional capacity of 8 mgd. With the expanded existing plant capacity of 8 mgd and the total planned ultimate capacity of the proposed second plant, the total planned ultimate wastewater treatment capacity would be 16 mgd.

### **Capacity of Existing Facilities for Present Service Area**

The Sewer Master Plan Update found that the existing trunk sewer system is adequate for the existing area. The La Brucherie trunk sewer has capacity to serve future development on the east and southeast of the Study Area, including the County Center facilities south of the Study Area. However, the other trunk sewers generally do not have available capacity to serve future development outside of the present service area. The Sewer Master Plan Update recommended replacement of the Eastside Lift Station due to age and upgrading of Lift Station No. 3 to match the capacity of the La Brucherie trunk sewer.

### **Existing Service Capabilities Within Study Area**

Wastewater from existing development within the Study Area is disposed of through on-site individual or community septic tank and leach field systems in accordance with the requirements of the County Health Department.

### **Projected Service Capabilities Within Study Area**

The Sewer Master Plan Update is based on ultimately providing wastewater collection and treatment at the City treatment facilities for all areas within the Phase I and Phase II planning areas (Tiers I through III). Wastewater disposal for very low density residential development outside of the Phase I and Phase II service areas but within the Study Area will be through the use of on-site septic tank and leach field systems.

Providing wastewater collection service to the ultimate service area will involve providing addition treatment capacity and extending the wastewater collection and transmission system. Additional treatment capacity is proposed to be provided at or in the vicinity of the existing treatment facilities. Conveyance of wastewater from future development areas will generally involve new lift stations and transmission mains. Since most of the future development areas are farther from the treatment facilities than the



existing service area, costs for wastewater conveyance facilities will be higher for the future service area than for the existing service area. However, the level and type of facilities to serve future development will generally be consistent with the existing wastewater system.

## **COST OF WASTEWATER SERVICE**

### **Capital Costs**

The 1994 Sewer Master Plan Update identified required capital improvements to the wastewater collection and transmission facilities to maintain service levels to the existing service area and to provide service to future development areas. In general, the improvements identified in the Sewer Master Plan Update are required to provide capacity for future development.

Recommended improvements to the existing wastewater collection and transmission system for the existing service area are to: (1) upgrade the capacity of Lift Station No. 3 to match the La Brucherie trunk sewer capacity; and (2) replace the Eastside Lift Station due to age and standby capacity limitations. The estimated cost for these improvements is \$1,290,000 (Reference 3).

Projected capital improvements for the wastewater collection and conveyance system to provide capacity to serve future development in the Study Area were identified in the Sewer Master Plan Update. The total estimated cost for trunk sewers, lift stations, and forcemains to serve future development areas is \$19.2 million (Reference 3).

Additional wastewater treatment capacity will also be **required** for future development within the Study Area. It is projected that the existing treatment plant with the capacity expansion to 8.0 mgd will provide adequate capacity through the year 2005. It is assumed that the first 4 mgd phase of the proposed second wastewater treatment plant will be built by that year. Based on the flow projections in the Sewer Master Plan Update, the second 4 mgd phase of the proposed plant would not be required until after the year 2015, or after the 20 year planning period. It is assumed that the costs for expansion of the proposed second plant from 4 mgd to 8 mgd would be incurred following the 20 year planning period and are not included in the Service Area Plan capital cost projections.

Based on a unit capital cost of \$2.00 per gallon per day of capacity for a pond type treatment system (Reference 6), then a treatment capacity capital cost of \$8.0 million will be incurred in the year 2005. The design concept for the future second treatment plant is not developed at this point. The unit cost assumed above is based on typical unit costs for a facultative pond treatment system. Depending on the actual design of the second treatment plant, capital costs may vary significantly from the general unit cost used above. Additional planning and engineering for the second treatment plant will be required to prepare a conceptual level cost estimate for the facility. Because a pond system primarily involves earthwork construction, costs can be very site specific and can be significantly influenced by such factors as: land availability and cost; volume of earthwork required; pond lining requirements; and auxiliary construction.





The required capacity improvements can be grouped into three categories:

1. Treatment and disposal facilities.
2. Trunk sewer pipelines.
3. Lift stations and force main pipelines.

The costs for treatment and disposal capacity are independent of the location of the development requiring the service. The costs for trunk sewer pipelines depend on the location of the development relative to treatment facilities. Costs for lift stations and force mains are a function of the location of the drainage basin relative to the treatment facilities. Table 4.1 summarizes the estimated sewer pipeline costs to serve the ultimate future wastewater service area from the Sewer Master Plan Update (Reference 3). Tables 4.2 and 4.3 present the cost estimates from the Sewer Master Plan Update for the lift stations and forcemains projected to be required to provide wastewater conveyance service to the ultimate future service area (Reference 3).

The estimated costs of the trunk sewers and lift stations and force mains required to serve ultimate future development as presented in the Sewer Master Plan Update have been segregated and assigned to the corresponding Tier I, II, and III service areas. This cost breakdown is based in part on the fact that the tiers were developed as a function of the ability to provide utility services to these areas. Cost estimates for trunk sewers and lift stations/forcemains serving areas in more than one tier were allocated based on service area size. The cost estimate breakdown for collection facilities to serve the Tier I, II, and III areas is as follows:

<u>Development Area</u>	<u>Cost</u>	<u>Dwelling Units</u>	<u>Unit Cost<sup>a</sup></u>
Tier I	\$4.0 million	3,900	\$1,025/dwelling unit
Tier II	\$5.0 million	2,770	\$1,800/dwelling unit
Tier III	<u>\$10.2 million</u>	<u>11,360</u>	\$950/dwelling unit
Total	\$19.2 million	18,030	\$1,100/dwelling unit

<sup>a</sup> Actual cost will be less with contribution from commercial/industrial development within tier.

Capital costs for the collection and conveyance facilities in five year increments for the 20 year planning period were developed based on the estimated percent development of each tier, as established in Section 2, multiplied by the total ultimate cost for that tier as listed above. Total estimated capital costs for wastewater collection and conveyance facilities and treatment facilities to serve future development in five year increments over the 20 year planning period are presented in Table 4.4. These costs only include those costs to be incurred during the 20 year planning period from 1995 to 2015. Development beyond the 20 year planning period and costs to provide wastewater service to that development beyond the planning period are not addressed in this Service Area Plan.





Table 4.1

## Estimated Cost for Future Trunk and Collector Sewers

Development Area	Drainage Basin	Sewer Type	Diameter (inch)	Length (feet)	Average Depth (feet)	Unit Cost (\$/ft)	Total Cost (\$1000)
Western	I	Trunk	33	1,800	24	265	\$477
			30	12,000	21	175	\$2,100
			27	4,000	6	93	\$372
	II	Collector	12	45,000	6	36	\$1,620
		Collector (a)	12	5,500	7	38	\$209
Southern	III	Trunk	18	8,100	11	63	\$510
			15	12,000	9	48	\$576
		Collector	12	28,000	7	38	\$1,064
			10	4,700	6	33	\$155
Southeastern	IV	Trunk	18	5,100	10	59	\$301
		Collector	10	8,700	5	32	\$278
Eastern	V	Collector	15	2,500	5	40	\$100
	VI	Trunk	27	2,800	14	121	\$339
			24	1,400	7	78	\$109
			21	1,400	7	62	\$87
			12	1,600	6	36	\$58
	VII	Collector	18	4,900	8	54	\$265
			12	5,000	8	40	\$200
			10	14,000	7	33	\$462
	VIII	Trunk	15	1,300	14	62	\$81
			12	2,700	11	47	\$127
	IX	Collector	10	5,300	8	35	\$186
			18	1,500	8	54	\$81
		Trunk	15	1,300	9	48	\$62
			12	7,000	12	49	\$343
			12	13,000	10	44	\$572
Northeastern	X	Collector	12	14,000	6	36	\$504
Northern	XI	Trunk	33	8,100	24	265	\$2,147
		Collector	12	4,100	5	36	\$148
	XII	Collector	12	7,500	9	41	\$308

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Total Cost for Future Sewers = \$13,839

(a) Includes future collector sewers in Drainage Basin A-1



**Table 4.2****Estimated Cost for Future Lift Stations**

Flow Basin	Pump Station	Pumping Capacity (gpm)	Unit Cost (\$/gpm)	Total Cost (\$1,000)
III	Southern Pump Station	3,200	172	\$550
V-IX	Evan Hewes Pump Station	5,300	136	\$720
VII, IX	Route 111 Pump Station	1,500	212	\$318
X	Northeastern Pump Station (a)	700	300	\$210
A-1, I-XII	Lift Station No. 3 Expansion	12,000	200	\$2,400
Total Cost For Future Pump Stations =				\$4,200

**Table 4.3****Estimated Costs for Future Forcemains**

Flow Basin	Pump Station	Capacity (gpm)	Size (inch)	Length (feet)	Unit Cost (\$/ft)	Total Cost (\$1,000)
III	Southern Pump Station	3,200	18	11,000	50	\$550
V-IX	Evan Hewes Pump Sta.	5,300	21	7,600	60	\$456
VII, IX	Route 111 Pump Station	1,500	12	3,000	36	\$108
Total Cost For Future Forcemains =						\$1,114



**Table 4.4**  
**Estimated Cost of Wastewater Service**  
**for Future Development**  
**(\$1,000<sup>a</sup>)**

Year	2000	2005	2010	2015	Total
Treatment Facilities	\$0	\$8,000	\$0	\$0	\$8,000
Collection/Conveyance Facilities					
Tier I	\$1,600	\$1,200	\$800	\$400	\$4,000
Tier II	\$500	\$500	\$2,000	\$2,000	\$5,000
Tier III	<u>\$0</u>	<u>\$510</u>	<u>\$510</u>	<u>\$1,020</u>	<u>\$2,040</u>
Subtotal	<u>\$2,100</u>	<u>\$2,210</u>	<u>\$3,310</u>	<u>\$3,420</u>	<u>\$11,040</u>
Total	\$2,100	\$10,210	\$3,310	\$3,420	\$19,040
Unit Costs					
No. of Dwelling Units	1,800	2,080	2,430	2,870	9,180
Cost per Dwelling Unit <sup>b</sup>	\$1,170	\$4,910	\$1,360	\$1,190	\$2,070

<sup>a</sup> ENR Construction Cost Index 6510, April 1994.

<sup>b</sup> Actual cost will be less with contribution from commercial/industrial development.





Table 4.4 includes an approximation of the capital cost per dwelling unit for wastewater service for each of the five year increments over the 20 year planning period. The costs for the period ending in the year 2005 are higher than the other periods because of the treatment capacity cost projected to be incurred that period. The cost of this capacity addition will actually be repaid by development in subsequent periods. The overall cost per dwelling unit is approximately \$2,070 which is the total estimated cost of \$19.0 million through 2015 divided among an additional 9,180 dwelling units by the year 2015. These costs do not include financing costs.

The unit costs discussed above are based on only residential development. Additional revenue will be realized from future commercial and industrial users. Presently, commercial and industrial wastewater flows are approximately 40 percent of the total wastewater flow in the City. If the future service area develops with similar commercial/industrial flows, the overall capital cost per dwelling unit will be approximately \$1,200.

The costs per dwelling unit presented in Table 4.4 and discussed above are intended to provide a general estimate of the capital cost per dwelling unit for wastewater facilities to serve future development. A rate study would be required to establish actual connection fees and user fees. As discussed below, capital costs for the wastewater system are financed through various means. Depending on the methods of financing, these costs will be passed on to the user directly or indirectly in the form of user fees, connection fees, and housing costs. Costs for wastewater service for commercial and industrial users will be passed on to residents in the form of costs for goods and services.

### **Operation and Maintenance Costs**

The City's 1995 budget for operation and maintenance of the wastewater collection and treatment facilities, excluding profession services and capital expenditures associated with the existing plant expansion and planning for the second plant, is approximately \$2.5 million. Excluding contributions from commercial and industrial users, this annual operation and maintenance cost represents an average annual cost of approximately \$230 per dwelling unit excluding commercial and industrial contributions.

It is projected that wastewater operation and maintenance costs will increase in proportion to wastewater volumes which will increase in proportion to population growth. Therefore, the unit cost of operation and maintenance per user will remain at present levels, not considering inflation. Based on the above, the projected wastewater system operation and maintenance budgets for the next 20 years in five year increments, in present value dollars, are as follows:

<u>Year</u>	<u>Projected Annual Operation and Maintenance Cost</u>
2000	\$2.9 million
2005	\$3.4 million
2010	\$4.8 million
2015	\$5.6 million



## **Debt Repayment**

The City incurred long term debt of \$4,460,000 in 1994 to finance construction of the wastewater treatment plant expansion. The City is also repaying other long term debt. Long term debt for capital improvement projects is repaid from wastewater service fee revenue. Present annual debt repayment costs are \$541,492, or \$50 per single family dwelling unit excluding commercial and industrial contributions.

## **Projected Allocation of Cost of Wastewater Service**

Allocation of costs for wastewater collection, transmission, treatment, and disposal service between existing and new residents will be in accordance with the following:

- Costs for additional capacity for wastewater treatment required to provide service to new development will be paid by the new development through connection fees and wastewater service charges.
- Costs for collection sewers to serve new development will be paid by new development through assessment district financing or developer financing.
- Costs for trunk sewers to serve future development areas will be shared among developments contributing flow to the trunk sewer.
- Costs for lift stations and force mains to serve future development areas will be shared among the developments contributing flow to the lift station.
- Costs for capital improvements to maintain service to existing service area will be paid by existing users through wastewater service charges.
- Costs for capital improvements to upgrade facilities to meet new regulatory requirements will be paid by all users through wastewater service charges.
- Operation and maintenance costs will be paid by all user through monthly wastewater service charges.

## **FINANCING OF WASTEWATER SERVICE**

### **Present Wastewater Service Charges**

Nearly all of the annual wastewater utility revenue is from wastewater service charges. Single family and duplex users are charged a fixed monthly rate for wastewater service; \$17.22 for single family units and \$25.87 for duplex units. All other users are charged for wastewater service based on water consumption. The rates range from \$0.8600 to \$3.7556 per 1,000 gallons of water consumption. Wastewater service rates as a function of water consumption have been established based on the estimated proportion of water returned to the sewer and strength of the wastewater.

### **Connection Fee**

The City charges a Sanitary Sewer and Water Capacity Fee for new connections to the water and wastewater systems to pay for existing capacity investment. The charges are based on a base single family dwelling unit referred to as an Equivalent Dwelling Unit (EDU). The charges for users other than single family dwelling units are calculated in



terms of EDU's. The current connection fee is \$2,077.00 per EDU; 55 percent (\$1,142.35) of which is for wastewater capacity. Connection charges will cover the cost of providing wastewater service to development in areas with existing wastewater facilities. Connection fees will provide adequate financing for water service to some of the Tier I areas, but in general will not meet the capital requirements for providing wastewater service to future development areas.

## **Capital Improvements**

### **Existing Service Area Improvements**

Costs for major wastewater system capital improvements for service to the existing service area are financed by long term debt which is repaid from wastewater service charge and connection fee revenue.

### **New Service Area Improvements**

The method of financing capital costs of facilities to provide wastewater service to areas presently not within the existing service area will either be through formation of an assessment district, funding by a developer, or other method. Assessment districts may be used to provide for facilities which have city-wide or regional benefit. Typically more than one property owner pays into an assessment district via local tax collection.

Public facility improvements also may be directly funded and/or constructed by developers. The Subdivision Map Act contains provisions which allow the City to require the installation of public facilities as a condition of approval of a tentative map under the City's development review process. Developer funding and construction of sewer mains within the developed area is common. Developers may also be required to fund off-site improvements to lift stations and forcemains and to wastewater treatment facilities as a condition of tentative map approval.

## **Operation and Maintenance**

Operation and maintenance costs are financed by revenue from wastewater service charges.



**SECTION 5**  
**CONCLUSIONS**





## **SECTION 5**

### **CONCLUSIONS**

#### **WATER SERVICE**

##### **Facilities for Water Service in Future Development Areas**

The City presently provides potable water service to existing development within the city limits in accordance with regulatory requirements and national standards and at a cost to users consistent with other water purveyors in Southern California. The City can provide water service to planned development areas within its proposed expanded Sphere of Influence by expansion and extension of its existing water treatment and distribution system. Due to the single pressure zone nature of the existing water distribution system and centralized water treatment and treated water storage and pumping, extension of the existing water system to serve proposed future development areas can be accomplished through expansion of the existing facilities in proportion to the future growth.

##### **Cost of Water Service in Future Development Areas**

From Section 3, the average capital cost of water service facilities over the 20 year planning period, not including commercial and industrial contributions, is estimated to be \$2,360. On the basis that this cost would be financed over 30 years at a rate of 7 percent, the annual cost for repayment of capital would be \$165. With the cost of operation and maintenance of the water facilities remaining at current levels of around \$280 in present dollars as noted in Section 3, the average total annual cost for water service for future development over the 20 year planning period would be \$445 or \$37 per month, in present dollars. If future development includes a level of commercial and industrial development consistent with the existing development, commercial and industrial water demand would constitute approximately 30 percent of the future water demand. In that case and assuming commercial and industrial water service fees would be equitable with residential water fees, the total cost to residential users would be reduced by 30 percent to approximately \$312 per year or \$26 per month.

The present per capita water consumption (total water use including commercial and industrial divided by total population) is 206 gallons per capita per day. Based on 3.4 persons per household (Reference 1) and the \$1.10/1,000 gallons water service charge, the present cost of water service is \$280 per year or \$23 per month. This cost is primarily for operation and maintenance costs.

#### **WASTEWATER SERVICE**

##### **Facilities for Wastewater Service in Future Development Areas**

The City presently provides wastewater collection, treatment, and disposal service to existing development within the city limits in accordance with regulatory requirements and national standards and at a cost to users consistent with other wastewater agencies in



Southern California. The City can provide wastewater service to planned development areas within its proposed expanded Sphere of Influence by expansion of the existing wastewater treatment facilities and by construction of required wastewater collection and conveyance facilities. The location of the existing and proposed treatment facilities relative to the future development areas and the limited additional carrying capacity of the existing conveyance system results in greater pumping and interceptor sewer requirements for the future development relative to the existing wastewater service area. Due to the centralized wastewater treatment facilities, expansion of treatment capacity for future development will be in direct proportion to future development.

### **Cost of Wastewater Service in Future Development Areas**

From Section 4, the average capital cost of wastewater service facilities over the 20 year planning period, not including commercial and industrial contributions, is estimated to be \$2,070 in present dollars. On the basis that this cost would be financed over 30 years at a rate of 7 percent, the annual cost for repayment of capital would be \$145 in present dollars. With the cost of operation and maintenance of the wastewater facilities remaining at current levels of around \$230 in present dollars as noted in Section 4, the average total annual cost for wastewater service for future development over the 20 year planning period would be \$375 or \$31 per month, in present dollars. If future development includes a level of commercial and industrial development consistent with the existing development, commercial and industrial wastewater flows would constitute approximately 40 percent of the future wastewater flows. In that case, the total cost to residential users would be reduced by 40 percent to approximately \$225 per year or \$19 per month.

From Section 4, the present wastewater service charge for single family dwelling units is \$17.22 per month or \$207 per year.

### **CONCLUSION**

Based on the information developed in this Service Area Plan and in the Water and Sewer Master Plan Updates, the City will be able to provide water and wastewater service to the 1990 General Plan future development areas in accordance with present service levels and costs.



**APPENDIX A**  
**REFERENCES**





## REFERENCES

1. Brian F. Mooney Associates, City of El Centro, California, 1990 General Plan, March 15, 1989.
2. Engineering-Science, Inc., City of El Centro Water Master Plan Update, September 1994.
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6. U.S. Department of Commerce, National Technical Information Service, Industrial Environmental Research Lab, Research Triangle Park, NC, Radian Corp. Austin, TX, Cost Digest: Cost Summaries of Selected Environmental Control Technologies, 1984.



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